DELAWARE STATE MEDICAL JOURNAL

Issued Monthly Under the Supervision of the Publication Committee
Owned and Published by the Medical Society of Delaware

VOLUME 21
NUMBER 3

MARCH, 1949

Per Copy, 50c
Per Year, $4.00

THE IMPORTANCE OF ALLERGIC DISEASES IN MEDICINE*

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INTRODUCTION

[DR. CHARLES M. BANCROFT (Wilmington): It is a great loss to us all that Dr. Wittich was not able to be here. He himself was one of the early pioneers in the field of allergy and is also one of the leaders in the field today. In his paper, unfortunately, he does not quote any of the work which he himself has done.

He is connected with several teaching institutions, as well as being editor-in-chief of the *Quarterly Review of Applied Immunology and Allergy.* He is one of the editors of the *Annals of Allergy,* and is a very competent authority in the field of allergy.

Dr. Wittich has requested that I read the paper for him.]

Because of the limited time only a brief enumeration of the principles on which allergy is based, and some of the various syndromes in which allergy plays a role will be presented, in an effort to emphasize the importance of allergic diseases in medicine. *Broadly, allergy designates hypersensitiveness chiefly in man and is an abnormal physiological response of tissues to physical or chemical stimuli.* The term was coined by von Pirquet[1,2] after the Greek words meaning "altered capacity to react." His concept was that all disease symptoms acquired by an organism after acquaintance with any organic substance, living or otherwise, is the result of an altered condition.

There is probably no subject in modern medical science which is assuming more importance than the diseases of excessive sensitivity. There is an increasing and proper appreciation that allergy is wholly or partially responsible for many diseases and syndromes which are observed by nearly every specialty in medicine and surgery as well as the general practitioner.

The student of allergy must first have a thorough knowledge of diseased states in general, whether *infectious, metabolic,* or *degenerative.* He must be thoroughly trained to recognize their symptoms and supply proper management for each. Conversely, since allergy is to be met in general practice and in practically every specialty, the practitioner and specialists, particularly those in internal medicine, pediatrics, otorhinolaryngology, ophthalmology, dermatology, gastroenterology, and neurology cannot escape from responsibility in the diagnosis and treatment of allergic diseases.

When one considers that allergic diseases in one manifestation or another are *nearly universal* and that *nearly* 10% *of the population suffer from major allergy,* it can readily be realized that even the various specialties in medicine meet with a very small proportion of these sufferers compared with those met in general practice. If the greatest good is to be done, it is, therefore, necessary that the man in everyday practice be familiar with the more common manifestations of allergy, as well as be able to treat them, or, at least, recognize the condition to enable him to refer the patient to one trained to treat them properly. Based upon sound physiologic, immunologic, and chemical observations, our modern concept of allergy has advanced considerably in the past decade—far more than our knowledge of some other diseases; for example, of cancer, the leukemias, and some forms of arthritis.

Much of our knowledge of the concepts of allergy stems from the pioneer fundamental observations of bacteriologists, immunologists, chemists, and biologists. Clinical allergy of today owes much of its development to the principles established by investigators in the basic sciences. No physician can expect to apply allergy sucessfully to his practice without a thorough knowledge of the principles upon which allergy is based. Since 1921 there has been a rapidly accumulating literature on the subject, both investigative and clinical.

* Read before the Medical Society of Delaware, September 14, 1948, Rehoboth.
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Due to these fundamental observations, the concepts of the nature of allergic phenomena have become more closely correlated and integrated, particularly during the last decade.

After von Bering discovered diphtheria antitoxin in 1890, it was observed early after the use of antitoxin horse serum in some that there developed a serum disease or sickness; in others, serum shock, and that experimental injections of the antitoxin caused anaphylaxis in animals. These phenomena were eventually attributed to the serum proteins and not the antitoxins. von Bering's discovery not only laid the foundation for the concept of allergy by von Pirquet, but also led to the development of other antisera against other bacteria. Thus, the science of immunology was born, and has continuously paved the way to our progress in allergy.

Richet[3] (1902) began experimenting with certain toxins and observed that some of his animals, instead of becoming immune, became more sensitive. He called this increased reactivity "anaphylaxis" from the Greek meaning "without protection," as opposed to the usual immune state brought about by toxin injections.

Theabold Smith (1904), noting the similarity of Richet's anaphylaxis to the shock in guinea pigs due to diphtheria antiserum, not toxins, also applied the term to his phenomenon.

From even before Hippocrates' time "idiosyncrasies" to foods and odors were noted and mainly attributed to neurosis or hysteria. Since Richet's observations, immunologists have assiduously studied the mechanism involved in the phenomena of hypersensitiveness. The parenteral injection of a primary harmless foreign protein stimulates cells of the host to the specific proteins or antibodies, some *cellular* and the remainder *humoral* or *circulating* in the blood serum capable of neutralizing the antigens.

Although it has been known for a quarter of a century that anaphylaxis results from the union of a specific cellular antibody with its antigen, we still do not know why or which cells respond with the production of antibodies, or the basic reason for the explosive anaphylactic shock.

It was too bad that Blackley,[4] years before (1873), who demonstrated that pollen caused hay fever, did skin and eye tests with pollen and recorded local wheal and specific systemic reactions in hay fever victims only, did not have this concept to explain his observations.

Wolff-Eisner[5] in 1906, following the demonstration of anaphylaxis, was the first to suggest that hay fever may be such a phenomenon. Gillette in 1909 studied the records of cases of sudden death following the injection of diphtheria antitoxin and first called attention to the similarity of this anaphylactic reaction to bronchial asthma. He also observed that most of these deaths occurred in asthmatics following the *first,* not the usual second injection of antitoxin horse serum.

Serum disease developed following an injection of horse serum requires a period of incubation similar to that of experimental anaphylaxis. Thus, the concept of an antigen-antibody reaction developed to explain the cause of allergic diseases. For the next decade (1910-1920) empirical methods for clinical treatment, skin testing, the discovery of new allergens and preparation of extracts with some attempts at standardization were done. In 1921 the demonstration of positive skin-sensitizing antibodies that may be transferred from the serum of allergic patients to the skin of non-sensitive subjects, known as the Prausnitz-Kustner[6] or passive transfer reaction, marked a distinct advance in the development of our knowledge of allergy. By this technique the qualitative difference between the anaphylactic antibody and the atopic reagin could be demonstrated. Although the passively transferred cutaneous sensitivity was specific, Kustner cautiously did not postulate the existence of antibodies. He failed to demonstrate antibodies by the four then available methods of detecting precipitins. Following Noon's[7] empirical methods of a series of injections of the respective pollen-extract, it was clinically well known that this protection is specific and that the protective mechanism must neutralize either the sensitizing antibody or the autigen.

It is evident that the field of allergy is entering a new area. When broadening our view to fit our problems of clinical medicine controversies continue to arise. There is accumulating evidence that the release of hista-

mine in the anaphylactic or allergic reaction is incidental or secondary and, as our knowledge progresses, it is obvious that other mechanisms than the variations in immunologic specificity contribute to produce the state of altered reactivity (allergy). The relationship of the basic sciences of physics and chemistry, as well as psychodynamics must be included to explain the changes of neurovascular reactions either when acting independently or when combining with immunologic reactions. This evolution of our concepts of the basic principles of altered reactivity which produces the supersensitive state has been accomplished by proper observations of clinical manifestations in man and animals by many observers.

THE HISTAMINE THEORY OF ALLERGY

Abramson[8] has quoted seventeen experiments which are not compatible with the histamine theory as being responsible for the allergic reaction. Histamine serves as an implement for experimental purposes as shown by the recent successful clinical results with the various antihistaminic drugs. Controversy has also arisen whether the so-called "blocking" antibody plays a significant role in bringing about an anti-allergic or refractory state. It is necessary for us to understand some of these controversies when approaching the subject of the importance of allergic diseases in medicine.

Let us now make a practical application of these observations. Knowledge of the tissues in which the antigen-antibody reaction takes place—that is, the shock organ—is of considerable practical importance. The location and anatomic structure of these tissues are responsible for the resultant clinical symptoms. Time will not permit a discussion of the possible factors influencing allergy, but they will be enumerated here.

POSSIBLE FACTORS INFLUENCING ALLERGY

- Temporary predisposition
  - Gastrointestinal disturbances (increasing permeability, diet)
  - Edocrine influences (rhythm) (adolescence, menopause, senescence)
  - Fatigue (activity), intercurrent illness
  - Biologic (infection, toxins, foreign proteins)
  - Emotional
- Nature of Allergen (degree, frequency)
- Hereditary
  - Autonomic instability
  - Allergic tendency
  - Allergic genes
- Environmental
  - Chemical (proteins, acid, alkali, drugs, etc.)
  - Physical
    - Season
    - Weather
      - Pendulation of temperature, barometric pressure and moisture
    - Other physical agents (heat, cold, sunlight, pressure)

May I be permitted, at this point, to state that allergists do not for a moment claim that all of the diseases which will be mentioned in this discussion are strictly allergic in origin, although the majority are. In others, the phenomena of hypersensitiveness is no doubt responsible *in part* for the syndromes. Long standing or chronic states produce irreversible changes so that when first seen the role which allergy may play may be easily overlooked.

It is very important to know whether or not the portal of entry of an allergen is the same as the chief site of action of the allergen. Primarily, regardless of the site of the portal of entry of an allergen, damage to the sensitized cell calls forth a response of the reticulo-endothelial system, with increased capillary permeability, efferent dilatation, and consequent edema and anoxia of the tissue. Other reactions, resulting from increased glandular activity and smooth muscle contraction, depend upon their presence in the localized shock organ which, in turn, modifies the clinical picture.

This localized edema in any shock organ in the body gives rise to clinical symptoms appropriate to the part involved. This is true of the nervous system as well as of the skin and the mucous membrane. As Foster Kennedy[9] has pointed out "a tendency to hives or urticaria, to asthma, to hay fever, and to eczema is recognized generally as due to an allergic hypersensitiveness. But our profession as a whole has not as yet learned to think allergically enough to recognize that very many cases of migraine, of retro-bulbar neuritis, of sudden transient spinal and cerebral illnesses, can only be explained as being due to a sensitiveness of allergic character. They occur in the central nervous system and in the sympathetic and parasympathetic system as well."

"Furthermore, a sensitized person may exhibit allergic phenomena only on emotion when the autonomic nervous system is 'triggered' and in a reactive state, and such individuals may in time exhibit a system-habit re-

ferable to an unstable metabolism and autonomic mechanism."

He cites a case of a woman who, following sudden fright, within four to five minutes developed swelling of both feet severe enough to require an ambulance to move her from the spot. He mentions that paralysis of both shoulders, due to paralysis of the circumflex and long thoracic nerves, is commonplace following the administration of serum, such as anti-tetanus serum.

Undoubtedly, the medical profession in general has not paid enough attention to allergic headaches.

Any clinical disorders with common features of *heredity, common periodicity, temporary disappearance after severe infection,* and *eosinophilia* should arouse the suspicion of being allergic in origin.

The following slides are introduced to indicate not only the definite known diseases already due to the allergic mechanism but those in which the allergic mechanism is thought to frequently play a major or minor role and contribute toward the syndrome. Although a few may not belong to this list and are quite controversial, they are mentioned in the textbooks on allergy and are included for discussion purposes.

I. ALLERGY OF THE RESPIRATORY TRACT

Upper

Allergic Rhinitis:
- Seasonal (Hay-Fever-Pollinosis)
- Perennial (Vasomotor or Hyperplastic

Lower

Bronchi (Asthma)
Non-Infective Asthma (Exogenous)
Infective Asthma (Asthmatic bronchitis)

II. ALLERGY OF THE SKIN

Allergic Dermatitis:
- Intrinsic (Infantile Eczema, Atopic Dermatitis)
- Extrinsic (External Contact Type Dermatitis)

Urticaria
Angioneurotic Edema (Giant Urticaria, Quincke's Dis.)
- Purpura Group (Non-thrombopenic and Thrombopenic
- Erythema Group (Simplex, Nodosum, Multiforme)
- Lupus Erythematosus (Discoid and Disseminated Types)

I think we all agree that Atopic Eczema is entirely due to an allergic state. This also includes the intrinsic and extrinsic or external contact type dermatitis. Some consider all urticarias on an allergic basis. *Certain forms of urticaria are to be regarded as non-allergic in origin. Urticaria occurs far more commonly in women than in men. There is a familial and hereditary background in 60% of the cases and there is a high incidence of migraine in the families of female patients.* Countless cases have been reported since Wolff-Eisners first observations in 1906 in which the allergenic agent was identified beyond question, either by means of avoidance and exposure tests or by the passive transfer method.

Angioneurotic edema is closely related to urticaria. Actually the combination of the two lesions is rarely seen in the same patient at the same time or even at different times. It is relatively frequent and may become extremely serious. It is usually associated with other allergic manifestations. It is common on the soft tissues of the face, hands and feet, genitalia, et cetera. There may be very deceptive visceral manifestations. Severe headaches are a frequent concomitant. It may be associated with abdominal symptoms, generalized pain, vomiting, hematemesis, melena, and even abdominal rigidity. Angioneurotic edema of the respiratory tract usually involves the larynx and higher structures, although it may involve the bronchial tree. There may be visceral manifestations of angioneurotic edema without skin symptoms. This requires exhaustive and painstaking history to determine the offenders, including physical agents, foods and drugs.

Purpura Group. Non-thrombopenic purpura is frequently accompanied by joint lesions (Schonlein) or with gastro-intestinal lesions (Henoch's Disease). This type of purpura occurs frequently, but in general is mild. *Thrombopenic purpura is much more serious.* This occurs in acute or chronic form and frequently has a fatal termination. There are coagulation defects, diminished platelets, and increased capillary permeability.

In Henoch's purpura, however, as in Schonlein's Disease, there is no change in the *clotting* or *bleeding time* or in the *platelets. The lesions are fairly similar to serum sickness with petichiae, erythematous exanthem, urticaria and angioneurotic edema.* Alexander and Eyermann at the first reported three cases of food allergy to Henoch's purpura. Since that time, many have been reported. Hampton has studied the X-ray films of the entire gastro-intestinal tract in this condition and demonstrates *retension, hypermotility,* and *colon spasm.*

Lupus Erythematosus. The absorption of bacterial substance or products of their growth from areas of infection may cause any type of allergic disease. Bacteriology frequently causes vasomotor rhinitis, acute or chronic asthma, erythemata multiforme, lupus erythematosus, and eczemas and urticarias. Nothing is known, however, of the mechanism of the reaction.

III. ALLERGY OF THE CENTRAL NERVOUS SYSTEM

Allergic headaches—Migraine
Meniere's Disease
Epilepsy
Other Manifestations: (Cerebral edema)
- Transitory paralysis oculomotor nerve, hemianopsia, optic neuritis, and cord paralysis, retrobulbar neuritis, evanescent asphasia, hemiplegia, convulsive seizures, partial unconsciousness, intermittent amlyopia, disorientation, personality changes, fatigue, etc.

Heredity plays an important part in allergic headaches, including *migraine with a familial history of almost 90%.* It is very common. Half of the patients develop the disease between the ages of *twenty and thirty.* Menstruation frequently plays a role in women. Many observers have published statistics, especially Vaughan, indicating their allergic nature. Half of these patients obtain a reasonable amount of relief through the exclusion of offending foods.

In Meniere's Disease allergy can explain the exudative reaction of the labarynth which is char-

acterized by edema. Wherever edema occurs in an enclosed or confined space, the symptoms may be very severe and sudden. *These vestibular disturbances can be produced in guinea pigs following anaphylaxis. Many allergists have demonstrated foods as a cause. Tobacco is a common offender.* These cases are frequently referred to as cases of "allergic vertigo." That the condition may be associated to histamine sensitivity is shown by the fact that the *majority of these cases respond to histamine therapy.*

Epilepsy. It has been shown that a small group are definitely due to allergy by finding these patients sensitive to certain foods on individual food trials and then withdrawal. It is thought by some that the rigid diet to invoke ketosis, which aids, these patients, is a result of eliminating offending foods.

IV. ALLERGY OF THE PERIPHERAL NERVOUS SYSTEM

Neuralgias
Peripheral neurtis (brachial, sciatic)
Neuritides following serum therapy
Pruritus

Neuralgias. These are sequelae of common allergic disease (hay fever, migraine, and so forth). Individual food tests have definitely shown that certain foods can effect the cervical and brachial plexus. All of you are familiar with the neuritis following serum therapy. The basic cause of these pains is edema around the nerve tissue.

Pruritus is a common manifestation of allergy, particularly of foods. Many allergic diseases, whether systemic or local symptoms, are accompanied by pruritus (urticaria, dermatitis, neurodermatitis, and prurigo). Intense itching is frequently the first evidence of allergic reaction and may be the only sign. It may involve one site like the anus or vulva, which may be extremely distressing. Many offenders have been shown to produce the condition, such as tea, alcohol, coffee, tobacco, foods, sensitivity to insects, cold, heat, drugs, and inhalants.

V. ALLERGY OF THE EYE

Eyelids (Edema, Erythema, Eczema, Blepharitis)
Simple Allergic Conjunctivitis
Vernal Conjunctivitis
Scleritis and Episcleritis
Cornea (Interstitial Keratitis, Ulcer)
Uveal Tract (Iritis, Uveitis, Sympathetic opthalmia)
Endophthalmitis Phaco-Anaphylactica
Cataract (Rothmund's syndrome)
Retinal lesions

Allergy of the Eye. Time will not permit stressing the importance of allergy in this disease. *Vernal conjunctivitis is now considered by many to be a bacterial allergy.*

[DR. BANCROFT: A paper published about two months ago made mention of the fact that it is possible one differential sign between pruritus ani due to other causes, (contact, and so on,) as contrasted with pruritus and due to an allergic phenomena is that usually there is only itching and no redness.

I have noticed that particularly in a member of my family who was x-rayed and studied for many years, and we received all sorts of diagnoses. Eating oatmeal aggravated the symptoms intensely. We put her on a diet of nothing but oatmeal for 72 hours. The diarrhea increased and the itching became more severe, but no excoriation. Elimination of oatmeal has caused marked diminution of all of those symptoms. That was in the presence of a negative skin test, but skin tests with food, as you know, are very uncertain.]

Observers like Reudemann, Thomas, and Kuhn have shown that all of these conditions can be caused by foods or inhalants or both, as well as drugs. A good example of *drug sensitivity causing a cataract is dinitrophenol.*

VI. ALLERGY OF THE CARDIOVASCULAR SYSTEM

Heart
Cardiac arrhythmia, Simple tachycardia, Extrasystoles, Auricular paroxysmal tachycardia, Auricular fibrillation or flutter.
Myocarditis, Rheumetic endocarditis (Rheumatic fever)
Peripheral Vascular Disease (Thrombo-Angiitis Obliterans, Migrating phlebitis, Necrotizing arteritis, Periarteritis nodosa).
Angina pectoris—Tobacco Allergy

Cardiac arrhythmia has been caused by tobacco sensitivity as well as to a variety of foods. Harkavy has demonstrated antibodies to tobacco in the patient's serum, and frequently occur coincidentally or alternately with migraine, angioneurotic edema, hay fever and asthma. You are familiar with Rich's work on rheumatic fever. Focal lesions are necessary to incite the allergic state which could be continued with small doses of the offending organism. However, there is no specific agent or particular strain of streptococci as the cause. Rich has shown that rheumatic fever is a manifestation of allergy and notes the similarity of rheumatic fever lesions to those patients manifesting serum sickness or egg allergy. There is a connective tissue or colagen alteration. If an asthmatic patient lives long enough, he frequently develops periarteritis nodosa and the condition often accompanies bronchial asthma. There is a striking blood eosinophilia. *The relation of tobacco sensitivity and coronary artery disease has interested physicians for years.* Sometimes it is referred to as tobacco angina, although the mechanism is obscure. Harkavy found that 40% of these patients gave positive reactions to tobacco, of which 71% showed passive transfer reactions to tobacco. There is a marked high incidence of allergy in cases of coronary disease. The final test of all of these cases is the elimination of smoking and resumption to discover whether there is relief followed by return of symptoms. Certain reliable observers have reported angina pectoris and coronary disease as a result of sensitivity to foods, drugs, and pollens.

VII. ALLERGY OF THE DIGESTIVE SYSTEM

Mouth (Stomatitis, "Canker sores", Cheilitis, Glossitis, Mastoid)
Esophagus (Cardiospasm, Edema)
Stomach (Dyspepsia or Indigestion, Acute gastric crisis, Recurring peptic ulcer?)
Acute Gastro-enteritis, Recurrent vomiting, Diarrhea, Acute abdominal crises, Mucous colitis
Rectum (Tenesmus, prutitus ani)
Gall-bladder

Time will not be taken to discuss the various allergies of the digestive system, but these are fully described in textbooks. Recurring peptic ulcer is included because in the acute allergic reaction, there may be considerable release of histamin in the stomach which may produce secondarily a peptic ulcer.

VIII. ALLERGY OF HEMATOPOIETIC SYSTEM

Changes in Bone Marrow (Local eosinophilia, etc.)

Changes in Peripheral Blood (Eosinophilia, leucopenia, increased leucocyte fragility, hemolytic anemia, thrombocytopenia)

Agranulocytosis (Drugs)

Many observers have attributed changes in the bone marrow and peripheral blood to the allergic state and there is strong evidence in favor of allergy in many of these cases.

[DR. BANCROFT: We would leave the full discussion of this to Dr. Reed and Dr. Hooker, but with regard to the last one, agranulocytosis, Dr. Wittich hasn't mentioned it here but I am sure he would if he were here, and that is, these so-called anti-histaminic drugs evidently have their dangers. There have been some reports of agranulocytosis produced evidently following prolonged use of them. I believe one anti-histaminic has written on the box, "Do not give this drug continuously for more than three months."]

IX. ALLERGY OF THE JOINTS

Strictly Allergic Arthropathies (Serum disease, due to resorption of exudates, Food or Drug Allergy)

Intermittent Hydrarthrosis

Partially Allergic Joint Diseases (Infectious Allergic Arthropathies, Rheumatic and Rheumatoid Joint Diseases, Palindromic Rheumatism, Gout)

Allergy of the Joints. Serum sickness is accompanied by very disturbing joint symptoms. Intermittent hydrarthrosis has been shown to be caused by foods, drugs, physical agents, and proven by the exposure of the offender and withdrawal and again exposure. It is frequently recurrent and many patients have symptoms of food allergy. In the partially allergic joint diseases many patients have an allergic constitution and it has been shown that drugs, foreign proteins, injectants, blood transfusions, vaccines, and physical agents, as well as climatic changes may produce the condition.

Palindromic rheumatism is questionably allergic, although there is no definite proof that it is the result of a hypersensitive state. There is evidence, however, that gout, particularly the very sudden acute attacks, has been attributed to certain foods or beverages, since there may be a subsequent complete return to the normal of joints involved. Observers have pointed out the analogy to the joint involvement in serum sickness. It is thought that there is a fundamental predisposition to gout with a hyperuricemia and that the patient would have a predisposition to gout before an attack can be caused by an allergic reaction. There is no doubt that there are a number of etiologic factors which are non-allergic. Llewelyn identified certain kinds of meat, fruits and grains as causative factors. Vidal has shown that certain proteins used for clearing cheap wines may cause gout and others have demonstrated anaphylactic shock in animals by the injections of these proteins.

[DR. BANCROFT: This is self-explanatory, the intermittent hydrarthrosis, the intermittent swelling of the joints. Taub has reported one case due to a woman eating walnuts, but on the whole I do not believe the allergic aspect has been accepted by the medical profession as a whole. Then there is the phenomenon with which we are all familiar, that is, swelling of the joints following serum sickness. Probably many of you have noticed almost identical symptoms seem to be produced with the use of penicillin, many times not developing for 14 to 21 or 30 days after the use of penicillin, but characterized by swollen joints, fever.]

X. ALLERGY OF THE URINARY TRACT

Kidneys (Associated with other allergies, hematuria, glomerulonephritis due to Henoch's purpura)

Ureters (Colic without stones, assoc. with other allergies)

Bladder and Urethra (Spasm, edema, dysuria, frequency et cetera, enuresis)

Hemoglobinuria

Allergy of the Urinary Tract. This may be caused by edema, capillary permeability, spasm of smooth muscle, and so forth.

XI. ALLERGY DUE TO CHANGES OF FEMALE ORGANS

Hormonal endogenous allergy:

1. Menstruation: Cutaneous lesions (acne, herpes, urticaria, dermatitis, erythema, vulvar pruritus), migraine, nausea, vomiting, rheumatoid-neuralgic symptoms, and asthma.

It is well known that many allergic manifestations occur during the menstruation period. The next two slides are reproductions of photographs taken from Urbach's Second Edition. The first slide shows the premenstrual exacerbation of dermatitis dysmenorrheica. This shows the condition following menstruation and between menstrual periods. Premenstrual blood contains a substance that when injected in a patient during the intermenstruam will evoke an immediate urticarial reaction.

2. Pregnancy.

The last picture shows that allergy may be caused by a fetal protein. It is a case of *lichen urticatus* in a pregnant woman from the 6th to 9th months. The skin completely cleared after delivery.

In conclusion, I wish to emphasize the great principle that specific protein sensitiveness in a hypersensitive individual may produce localized edema and anoxia in any part of the body, producing symptoms appropriate to the part involved. The intensity of the symptoms depends upon the pressure produced by the edema, particularly in rigidly confined spaces. With this principle in mind, allergic diseases should always be considered when symptoms are present in any tissue of the body which could be accounted for by a local extravasation of fluid as a result of increased capillary permeability. Appropriate management can then be pledged upon a rational and logical basis.

DISCUSSION

DR. L. C. MCGEE (Wilmington): I think we are indebted to Dr. Bancroft for his nice bit of "pinch-hitting" since Dr. Wittich could not be here. Dr. Wittich has ably reviewed the history of allergy, and I should like to stress three points which interest me and I think interest many of you who are dealing with this problem.

In the first place, there is not only a list of

well known and for some time well recognized allergic diseases, but this list is growing. We are on the threshold of accumulating considerable evidence pointing to the etiological relationship of allergic diseases to the development of chronic disorders which have not been fully understood heretofore and to the development of degenerative diseases. The evidence is incomplete but it is accumulating, and I think in the next few decades we will see more impressive facts explaining some of the poorly understood chronic disorders and degenerative diseases.

The second thing which I would like to stress is the tendency at present for us to depend upon the anti-histaminic drugs. I wonder if in the last few years we have not overdone the empiric symptom relieving therapeutic approach to the exclusion of a good diagnostic workup, the defining of the allergen so that the cause of the symptoms may be removed.

The anti-histamine drugs are useful drugs, but there are many patients who wait until the hay fever season is here, or until other periodic allergic manifestation develops, and then rush to the physician for relief. As soon as the physician has given a measure of relief the matter rests. Quite frequently that is the patient's fault. I think we might correct this lack of adequate care by stronger emphasis on the desirability of more careful study for the patient's own welfare.

This leads me to the third point. You will note that Dr. Bancroft, in referring to the allergic manifestations in his own family, had such a diagnostic followup in the way of a therapeutic test of the suspected oatmeal. Oatmeal was given exclusively for 72 hours to confirm the diagnosis. We should do more of that, particularly in the well established situation which comes to our attention. One of the common ones is an allergy of the skin. I hope we will keep in mind and demonstrate our thoughtfulness in this direction by recalling that these skin conditions are in two great categories: first, the primary chemical or physical irritations; and second, the sensitization group. It is not enough in the latter group to have the lesions of the skin heal and allow the patient to go back to the environment which produced that lesion in the first place. This invites undesirable repeated acute manifestations and finally chronic manifestation of the sensitivity of the skin.

The physician needs to give the immediate therapy, but the second part of our responsibility is to define the allergy to protect the patient in the future. The rules have been well presented by dermatologists and allergists. I find a fear on the part of physicians outside of those particular fields to use the skin patch test. I believe there has been sufficient experience with the patch test, where it is applied properly that no one need have hesitation in using it. It is necessary to have proper respect for the condition of the skin where you are applying it after the acute manifestation has subsided and have proper respect for the dilutions with which you start such testing.

The thing which a physician gains by using the patch test in the case of contact dermatitis often is a recognition of the agent causing the disease. There are many things which can cause the allergic manifestations of the skin. We can't be clairvoyant, we haven't a chance to guess right in all of these patients. We frequently will be surprised if we go through the possibilities in patch-testing these individuals, with proper spacing between the application of the test, in what we learn. There will be many grateful patients, because the patients, through that knowledge, are able to avoid contact and further disorders.

DR. BANCROFT: In talking to Dr. Wittich two days ago he emphasized again the fact that some points in these slides are controversial, but we are reaching out into a new field.

It is interesting that Dr. Cooke, of Bellevue Hospital, makes mention in his book something we are using to tie these diseases together. It is something that we have learned through the pathologist. Many illnesses—he mentions only three or four and other doctors have added others—known allergic illnesses and suspected allergic illnesses, are morphologically characterized by a fibrinoid degeneration of collagenous tissue.

That is evidently an end result, and Cooke himself mentions in his book that while it cannot be doubted that fibrinoid degeneration of collagenous tissue is characteristic of aller-

gic state, it should not be maintained, however, that fibrinoid degeneration is evidence of allergy.

In other words, we have something here and something there, and with Dr. Wittich's talk and his slides, we are trying to tie these things together.

In closing, I would like to add something which comes up a great deal if you are interested in allergy. There is little point in sending a patient to the hospital to have 150 or 200 skin tests done and when he comes back say, "You are or you are not allergic to this, that or the other."

It may be that with inhalants a positive test is of importance, but a patient may have a positive test for ragweed and have no symptoms during the ragweed season. A positive skin test for a food means that the patient is, was, or will be allergic to that food. Certainly, that doesn't mean that the skin tests are at fault. A most important thing in treating an allergy patient is to take a good, careful history, as in all other branches of medicine. You wouldn't diagnose a heart patient by just taking an electrocardiogram, as Dr. McGee brought out, nor should you diagnose an allergy patient by some technician doing tests that you, yourself, don't even see.

423 LaSalle Medical Bldg.

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INFECTIOUS HEPATITIS*

W. PAUL HAVENS, JR., M. D.,**
Philadelphia, Pa.

INTRODUCTION

With the onset of World War II, a new chapter was begun in the history of acute hepatitis. The first contact with a military epidemic of jaundice in this War appeared when the U. S. Army was suddenly confronted, early in 1942, with an outbreak of jaundice of unknown type. This variety of jaundice was soon recognized as *homologous serum jaundice*, caused by a virus of hepatitis contained in the human serum used in the preparation of yellow fever vaccine. Tens of thousands of cases resulted from this accidental contamination.

Our second experience of the War with jaundice was equally if not more disastrous, and began with our invasion of North Africa in 1943, persisting until the present and penetrating many far-flung parts of the world. This variety of jaundice was epidemic infectious hepatitis, the naturally occurring disease. Again, tens of thousands of cases occurred. Fortunately, the death rate in both diseases was low, although the period of disability was so great as to make hepatitis one of the most important causes of loss of time among troops.

The exact relationship between these two forms of hepatitis is still not clear. Various experimental observations suggest that they may be similar although not identical diseases. At all events, they are indistinguishable clinically and pathologically and, for the purposes of discussion today, I should like to combine them under the term *viral hepatitis* and review with you certain of the problems made evident by the experience of recent years.

At the outset of this discussion, I should like to call attention to the fact that, until very recently, the classification of viral hepatitis was a clinical-pathological one, based on the early concept of Virchow that the jaundice resulted from the obstruction caused by a plug of mucus in the ampulla of Vater. In spite of the unequivocal evidence assembled for many years that the essential lesion of the disease is inflammation and necrosis of the

* Read before the Medical Society of Delaware, Rehoboth, September 15, 1948.
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hepatic parenchyma, medical opinion, in general, continued to accept the early concept of Virchow. It is only recently that the actual pathogenesis of the disease has been widely appreciated, and this has probably been aided by the discovery that the causative agent is a virus which primarily affects the liver.

CLINICAL COURSE

Early symptoms point to a disturbance in the upper gastrointestinal tract, and evidences of hepatic damage occur later. Clinically, the disease may be divided into two phases, *pre-icteric* and *icteric*. These two phases have characteristic symptoms and signs. The pre-icteric stage, which may last from five to ten days, is usually marked by anorexia, nausea, fever, and abdominal distress. The white blood count often shows a leukopenia at this time, to be followed by an increase in abnormal lymphocytes. The liver is seldom large in this early stage, but there may be splenic and cervical lymph gland enlargement. The icteric stage, which follows, may last from two to ten weeks. Jaundice is frequent, but clinical jaundice is not an essential part of the picture; milder cases do not show it. Usual symptoms in this icteric stage consist of abdominal discomfort in the form of epigastric or right upper quadrant pain, continued nausea, enlargement and tenderness of the liver, and light or even clay-colored stools. Before improvement starts, there is apt to be a good deal of weight loss. The white blood count is normal in this stage.

The facts suggest that viral hepatitis usually is a mild, benign, self-limited disease. Although the morbidity may be high and the course of disease, in adults, often prolonged and debilitating, the over-all mortality rate is low—under four per thousand. When death does occur, the liver has the appearance usually described as acute or sub-acute hepatic necrosis.

RELAPSE

Relapse is not uncommon, and reports of its frequency vary from 3 to 18 per cent of adult cases. Jaundice frequently does not recur, but anorexia, pain in the right upper quadrant, and hepatomegaly are characteristic. Relapse may occur before recovery is complete from the initial infection, or may become evident after the patient is discharged from the hospital apparently well. In general, relapse is followed by complete recovery, although a few patients develop evidence of chronic hepatic disease. The most valuable aids in diagnosis are positive bromsulfalein dye retention test, cephalin-cholesterol flocculation and thymol turbidity tests.

CHRONIC HEPATITIS

Of particular interest in these years immediately following World War II is the determination of how often permanent hepatic damage with functional impairment of the liver occurs, following either form of viral hepatitis. The magnitude of this problem is attested by the fact that at least 171,000 American troops had hepatitis with jaundice. In addition, although it is not known exactly, it might be conservative to estimate that an equal number had hepatitis without jaundice. The development of adequate criteria for the recognition of residual hepatic damage is one of the current problems in the investigation of this disease. Although these methods are imperfect, the bulk of evidence based on the clinical course of disease, various tests of hepatic function, and serial biopsy study of the liver suggests that viral hepatitis is generally a self-limited disease with complete recovery.

It is, as yet, undetermined how often chronic hepatic disease follows viral hepatitis. It is apparent from accumulating clinical and laboratory data and serial biopsy study of the liver that a small percentage of patients develop chronic hepatitis or cirrhosis of the liver. It is not surprising to observe that this should be true when one considers the tremendous degree of damage to the liver in even the apparently mild cases. The exact size of this group will be better defined in subsequent years; however, it would not seem unwarranted to predict that, in keeping with the natural history of many other acute infectious diseases, this group will be relatively small and the majority of patients will have no measurable residual damage from their viral hepatitis.

DIAGNOSIS

In the absence of a specific immunologic test for infectious hepatitis, diagnosis, in the *pre-icteric* phase, must be made on clinical and epidemiological evidence. This also ap-

plies to cases in which jaundice never becomes apparent. Early in the disease, percussion tenderness over the liver, with posterior cervical adenopathy and splenomegaly, may be of assistance. Palpation of the epigastrium frequently causes nausea. Evidence of liver dysfunction may be indicated early by certain tests. The bromsulfalein dye retention is usually the first to become abnormal, and this may occur as early as the second day of fever. The cephalin-cholesterol flocculation and then the thymol turbidity tests next become positive, and ordinarily bilirubin appears in the urine at the end of the pre-icteric phase before jaundice is apparent. During this phase, leukopenia with lymphopenia and subsequent neutropenia is characteristic. Relative lymphocytosis with numerous large atypical lymphocytes, similar to those found in certain diseases of viral etiology (measles, dengue, sandfly fever), appears late in the pre-icteric phase.

When jaundice appears, differential diagnosis between other infectious diseases which may be accompanied by jaundice may not be easy. In such circumstances, one must consider acute and sub-acute cholangitis, Weil's disease, yellow fever, malaria and infectious mononucleosis. The subsequent course of disease, the leukocyte count, the geographic location, and the demonstration of specific causative agents or their antibodies are of assistance. In addition to the jaundice associated with various infections, one must consider, in diagnosis, the jaundice caused by increased destruction of blood, by destruction of the liver by various toxic agents, and by obstruction of the common or hepatic ducts.

Particularly in older patients is the differential diagnosis of jaundice difficult, requiring careful correlation of history, physical examination, results of tests of hepatic function and, not infrequently, biopsy of the liver or exploratory laparotomy.

TREATMENT

The treatment of this disease is essentially symptomatic, since none of the chemotherapeutic or antibiotic agents now known is of any value. The most important therapeutic principles to be observed are *bed rest* and *excellent diet*. The conventionally prescribed low-fat diet for patients with disease of the biliary tract or liver is not adequate for infectious hepatitis. Recent studies have shown that the addition of cream, butter, eggs and milk to a diet high in protein and carbohydrate makes it possible to increase the caloric content when the patients require it, replace lost weight earlier, shorten the period of convalescence, and hasten the return to normal of the tests of hepatic function.

The exact duration of bed rest and the number of calories necessary for adequate recovery are not known. Many of the precepts of therapy have been derived from observation of the disease in troops debilitated by hardship. It is entirely possible that the therapeutic regimen may be modified in those patients who start their disease in relatively good physical condition.

DISCUSSION

DR. J. W. HOWARD (Wilmington): I don't know whether the Program Committee went over my past medical record before they put my name on the program, but I am one of these "critters" that has had infectious hepatitis, and I can personally vote that the anorexia is a real problem. At least those of us of the male sex, who like to eat, are seriously handicapped in a case of infectious hepatitis by just not having any desire to eat whatsoever.

This problem of epidemic hepatitis, from a laboratory point of view, is important, and the remarks Dr. Havens has made are very interesting, I think, to all of us. As he indicated, a long, long time ago we talked about acute or idiopathic yellow atrophy, and about catarrhal jaundice. I believe most of us in the room were instructed, as he has indicated, that the latter was due to a plug of mucus.

Like so many of the medical conditions with which we have dealt, if we go back into history, we find that somebody had some ideas about etiology that we have discarded, so we find there were people who did not believe that plugging of the ducts was the cause of jaundice. Likewise we have ignored the suggestion presented somewhere around 1890 that catarrhal jaundice and acute yellow atrophy might be an interrelated phenomenon. A number of papers since that time indicate that there has been continual scientific thought along this line.

As the speaker pointed out, it remained for the so-called pandemic of World War II to bring to us an opportunity to study this condition.

I think some 296 fatal cases have been studied by the Army Institute and very magnificently recorded for those of us who have been interested in the pathology and the clinical aspects.

Apparently of the fatal types of cases there are two groups: the fulminating variety, much like the cases shown today, died in ten days or less, in which there was a cirrhosis of the liver without too much decrease in size and no attempt at regeneration; and the subacute variety that lived longer than the ten-day period and as long as 100 days, in which there is a certain amount of regeneration, and a small, contracted liver.

This subacute variety, I believe, is the type that we were accustomed to call the idiopathic yellow atrophy.

As the speaker indicated, there is no possibility at the present time of differentiating the type of hepatitis that we see in homologous serum jaundice from the epidemic variety.

The question of the atypical lymphocyte is of great importance to those of us who have to pass opinion on blood smears in the laboratory. On two or three occasions in my experience, the appearance of jaundice has given us a clue in a case which we were thinking of as acute glandular fever. On the other hand, the English school of hematologists have said for a long time that there is a variety of acute glandular fever of which hepatitis is a part.

Dr. Damashek in Boston has put out a feeler suggesting that perhaps the virus of acute glandular fever and of epidemic hepatitis may be the same or an interrelated virus.

I can't pass a personal opinion on that.

The viruses of the homologous serum jaundice and the epidemic variety may or may not be the same type of virus, though their pathology is the same. I believe that if the speaker had more time he could probably have related some experiments in humans, in this regard. The human volunteers seem to be the only guinea pigs we have that indicate that there may be a difference between the virus recovered from the epidemic case and that of the homologous serum jaundice, as suggested by the fact that the same volunteer could be infected twice by the supposedly two different varieties of the virus.

The occurrence of jaundice following plasma is a problem for all the men who have to deal with the blood bank and the plasma bank in a hospital. It is bad enough to try to find plasma and blood, let alone the worry about what is going to happen to people who receive pooled plasma.

From my point of view, I think the literature on the subject of jaundice following the administration of plasma is a little difficult to interpret. If you scare easily, then we have had a rather high incidence of jaundice following the administration of pooled plasma. If you are very critical, you will say we are not sure that all the patients who had jaundice were carefully screened to make sure that jaundice did not come from some other cause.

So those of us who like to take a conservative road sort of sit in the middle. We can assume no responsibility for the Red Cross plasma, and are using it as sparingly as possible and only in emergency types of conditions. Frankly, however, as well as an average hospital followup can indicate, there have been not too many cases of jaundice that might be related. We have had a few, but like most they have not been reported.

I wish to extend our appreciation to the speaker for joining us today.

SOME LIMITATIONS IN ROENTGEN DIAGNOSIS*

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Philadelphia, Pa.

During the past several years a number of papers have been presented generally referring to diagnostic roentgenologic limitations. For instance, one is titled "How to be wrong; the x-ray a quick and easy method" (1); another, "Radiology—Empiricism or Science." (2). Because of inherent limitations to the scope of this diagnostic method it is easy to be wrong, particularly if one uses this means only to corroborate rather than to challenge a clinical opinion. It is empiric to the extent that the opinion expressed is particularly

* Read before the Medical Society of Delaware, Rehoboth, September 14, 1948.
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based on experience but not to the other extreme of unscientific quackery.

There are a multitude of technical obstacles between the patient and the recording medium any of which may be sufficiently serious to distort, obscure or even to counterfeit pathology. Some of these are analogous to the "rales" heard during auscultation due to hair between the stethoscopic diaphragm and the chest wall, and if understood or recognized may be circumvented initially or corrected at subsequent study. These roentgenographic difficulties run through an amazing list from the tremendous strength of a rebellious infant down to the scyballa in a poorly prepared colon. It is not too generally understood that the seriously ill patient may not be able to cope with the demands of the method. His inability most frequently is expressed by continued respiration or by other uncontrollable movement during roentgenographic exposure. All movement will result in poor detail and imperfect reproduction of pathology. Less frequently one is asked to study the gastrointestinal tract in patients so handicapped by weakness that all positions desired by the roentgenoscopist cannot be obtained. This produces an incomplete study and limits the value of the examination.

Considering the patient further, sometimes too much is added to him—breakfast before a gastric study, opaque feosol tablets before an abdominal study, excess fluids before excretory urographic study, opaque ointments and unnecessary casts before an examination of an injured extremity; and sometimes too little is taken from him—his cough reflex before bronchography, his gastric secretion in back of an obstructed pylorus before upper gastrointestinal study, his colon content before large bowel examination, and most unfortunately his pain.

There are more serious obstacles among these technical considerations which at present we cannot overcome by "wetting the chest hair." These include the weak capacity of portable apparatus generators and the poor roentgenoscopic image through heavy individuals. Although size of part no longer plays an important limiting role in non-bedside radiography, it does during roentgenoscopy; occasionally the screen image is so poor that the detail for small malignant lesions or peptic ulcerations is inadequate, and as a consequence proper film coverage cannot be selected.

Allergic responses to, or intolerance for, some of the contrast substances make some studies technically impossible. This is particularly a problem in excretory pyelography where sensitivity to the iodides exists; and sometimes this method is categorically essential, the retrograde method not being employable (following transplantation of the ureters into the colon). In other instances, when iodism denies its use and retrograde injection must be substituted renal function cannot be demonstrated, the ureters may be distorted (or straightened) by the catheters and the pelves overdistended. The loss of use of the excretory method for children is disturbing but not insurmountable.

Engineering developments can be expected to increase the usefulness of bedside roentgenography and improve the fluoroscopic image. Advances in chemistry will probably produce contrast agents more generally tolerated.

It would be unjustifiable to consider the limitations to the scope of roentgenologic diagnosis without considering the limitation that may be due to the capacity of the interpreter; as in all medicine, this is primarily an expression of degree of training. One can't over emphasize the importance of a thorough knowledge of normal roentgen anatomy. An analogy here is to present to the pathologist a slide of a normal virginal nipple for opinion. An answer of benign pigmented tumor, although not wholly incorrect by Websterian definition, would leave one with the opinion that a basic histologic background had not been developed. The os trigonum must not be mistaken for a fracture fragment separated from the astragalus nor on the os fabella for a "joint mouse" within the knee. Nonpathologic developmental variants from the average normal such as the septum for an azygos lobe must be recognized as well as the changes on the other end of the life scale which are the *normal* accompaniment of the aging process—these mostly being additional calcium depositions. The manifestations on the roentgenogram of superimposed shadows should be readily resolvable into the normal

components. Just as readily should the appearance of many different types of artefacts be apparent.

Limitations may be self-imposed. In the study of the gastrointestinal tract some roentgenologists permit the production of radiographs by a technician and then merely interpret the roentgenograms without the complementary work of fluoroscopic study. The acceptance of roentgenograms technically poor or of incomplete studies produces poor interpretation. Some examinations by their very nature require multiple projections or otherwise are inadequate. This is notably so in the skull where initial film coverage cannot be considered satisfactory without at least both lateral projections, an anteroposterior and a posteroanterior projection. The exposure of stereoscopic roentgenograms will depend on the ability of the examiner to obtain information from them. Lack of persistence on the part of the examiner or lack of versatility in the application of various procedures reduces the capacity of the method. To produce evidence of a small polypoid tumor of the colon it may be necessary to employ all known technics—single contrast studies with compression radiographs, mucosal relief studies, double contrast studies, and possibly a repetition of the entire examination to demonstrate constancy of a small lesion.

One may not neglect the fact that some encumbrances are imposed on the roentgenologist. Some physicians believe that he should have no clinical information and should be purely "objective." This objective requirement is harmful to the patient since frequently it results in an incomplete study, clinical information being necessary to formulate roentgenographic and fluoroscopic plans. Further, the absence of clinical background reduces the efficiency of differential diagnosis. Too general a requisition, particularly in traumatic work, may increase error. Areas of slight trauma may be overlooked in instances of excess film coverage. It is preferable to emphasize the specific part of interest. This is not a serious fault when the roentgenologist can examine each patient himself and decide on exposures; but such a situation is rare. Since complete reliance cannot be placed on technicians and since we really may not mean the same things by the same words, (i. e. leg frequently being used for lower extremity) it is evident that care and consideration should be given to indicating the exact part in which injury is suspected. Finally, haste for an opinion on the part of the referring physician frequently fosters the unnecessary hazards of sloppy radiography, "wet film" interpretation, rapid and incomplete reflection, neglect of comparison with previous studies, and possibly unwarranted decision on the basis of a single or "scout" roentgenogram.

One now considers the features that are inherent in the method itself that limit its scope, the characteristics of this latter being (1) range of demonstrability and (2) evaluation of the demonstrable.

Since the roentgenogram is simply an expression of differences in tissue densities, when a changed state produces a destruction of tissue or a new tissue, the reaction cannot be observed if it is of comparable density to the parent structure. This is spoken of as an absence of contrast. The list of such denied evidence is long but some obvious examples are cardiac infarcts and retroperitoneal sarcomas. Practically, it happens that the list, exclusive of such sub-roentgen manifestations as the fetus still in a nonosseous stage, can be reduced somewhat by recognition of distant or secondary manifestations that may raise a suspicion as to cause—pulmonary congestion or cardiac aneurysm after the infarction, and displacement of visualized abdominal organs by the mass of the sarcoma.

Inadequate contrast may be merely a matter of contentness with a single study or ignorance of other methods. There is now great selective range of quality of the x-ray beam and variations even in soft tissue can be demonstrated. With the use of body section radiography seemingly solid shadows can be shown to contain cavities and superimposed densities which may conceal an area on a plain roentgenogram can be blurred.

As one progresses into the range of added agents, more and more pathology can be revealed. In hollow tubular organs (gastrointestinal tract, bronchial tree) or in organs containing replaceable or excreted fluids (gallbladder, brain, circulatory system), materials

which produce contrasting densities may be introduced and most progress in extending the range of roentgen diagnosis is in this direction. If harmless materials can be found that are not only of a contrasting quality but are selectively absorbed and slowly excreted, one will be able to visualize even the ductless glands and the reticulo-endothelial and lymphatic systems. Such studies will be enhanced by the present radioactive isotope tracer experiments.

However, spectacularness is not necessary, nor should undue hazard be introduced. Admittedly, if the lower margin of the placental shadow is lost in the thickness of the pelvic bones, one cannot exclude the presence of a marginal implantation of the placenta. This organ could be visualized by abdominal aortography, but such radiography does not seem essential for the practice of obstetrics.

Although the use of added contrasting densities has even permitted the roentgen diagnosis of cancer of the heart, the use of contrast substances will not give all the answers. For instance, we have recently studied a patient with a large mass in the anterior and superior mediastinum in whom a final clinical differential diagnosis between substernal thyroid and aneurysm of the ascending aorta existed. It neither pulsated (for aneurysm) or moved with swallowing (for thyroid). Angiocardiography was decided upon since if the mass filled with diodrast its relation to the aorta would have been demonstrated and surgery would not be instituted. It did not fill with diodrast. Thorocotomy revealed a clotted aneurysm which could not possibly have filled with diodrast.

Most alterations in the biochemical and physiological fields of medicine cannot be demonstrated by roentgen procedures. There are some manifestations that may be recorded such as the relaxation of the sacro-iliac ligaments under the hormonal influence of pregnancy, the moulding of the fetal skull by the forces of labor, some secondary signs of endocrinopathy, the altered physiology of the small bowel in hypoproteinemic, avitaminic and allergic states but on the whole the contribution obtained from roentgenology is meager.

In consideration of the second characteristic of scope, evaluation of the demonstrable, it must be recognized that roentgenology consists particularly of the clinical practice of *gross* anatomy and *gross* pathology. Although there are many occasions when a suggestion as to the ultimate or histologic character of disclosed pathology can be rendered with considerable justification, this is done mainly by inference or deductive reasoning. Immoderate efforts of this type produce considerable error and reduce general confidence. There are few gross signs which in themselves are roentgenologically pathognomonic. The instances are rare when the roentgenologist can challenge the opinion of the histo-pathologist. The consultative opinion of the roentgenologist must always be read with these thoughts in mind. This is not discreditable; it merely warns against overemphasis of one diagnostic method by recognition of its proper functions.

Between the grossly normal and grossly pathologic shadows there are a vast number of criteria that are in a great land termed the "border-line of normal." An ocularly apparent finding may be either normal or actually an early phase of the abnormal. Many such considerations occur. The diagnostic weight accredited to a single sign increases or decreases respectively with the presence or absence or other features that could possibly be associated. But the absence of correlated or anticipated signs still does not always allow the one in question to be totally disregarded. As an example, in the study of the cranium for evidence of metastatic cancer, the skull may obviously contain many vascular lakes and pacchionian granulations; still one of these radiotranslucencies might represent neoplasm. In the pre-adolescent age frequently the inner table continues to show markings called convolutional thinnings. This is also a sign of increased intracranial pressure. If such a patient is under study for brain tumor the single finding could not be used as real evidence of intracranial pathologic changes.

Limitation in diagnosis in the skeletal system is entirely different from the problems of intracranial disease. In the latter usually the lack of evidence is due to the fact that the information cannot be elicited by available means, including intracranial pneumography. Of course there are sub-roentgen disease en-

tities in all structures including the long bones, such as the absence of structural change in an early stage of osteomyelitis, but in the latter this is not of frequent occurrence. The principle limiting factor is that the responses of bone to both inflammatory or neoplastic processes are not of great variety. Although the stimulus is different the observable result may be the same in either instance so that differentiation is not possible. This similarity is very striking between some cases of Ewing's sarcoma and pyogenic osteomyelitis or in other instances between Ewing's sarcoma and syphilitic periostitis.

This same mimicry of tissue response to inflammatory and neoplastic processes is extant in all the systems. The inflammatory lesions are usually differentiated immediately by appearance alone or by appearance and clinical findings. If they cannot be, the problem is not an insurmountable obstacle if an initial roentgenogram is not considered other than a survey study not unlike an introductory case history or initial physical examination. Of inestimable aid is the concept of serial studies to indicate variation with time. This is no different from the more frequently considered concept of hospitalization "for observation." Its great drawback is the increased time interval required before establishing a diagnosis which may have effect on the prognosis in cases of cancer.

The problem of differentiating inflammatory from neoplastic responses arises most frequently in the chest and gastric lesions and becomes more acute with the rapid advances in thoracic surgery and the changing concepts regarding the treatment of gastric ulceration. Roentgenologists are actually being required to perform less special diagnostic methods in reference to relatively obscure lesions of the pulmonary parenchyma than previously. We are being pushed to the wall especially in the diagnosis of bronchogenic carcinoma by the Papanicolaou stain of bronchial secretions and indeed by exploratory thoracotomy. In the stomach in most instances the exophytic or infiltrative cases of cancer are readily diagnosed; the difficulty occurs when gastric ulceration is the prominent or sole characteristic. There are not a few in which categoric statement cannot be made as to whether the lesion is a surgical or non-surgical problem. In no gastric cancer can the roentgenologist decide as to its operability since the total extensiveness of a malignant tumor either locally by invasion of contiguous organs or by metastasis to regional lymph nodes is not apparent; nor does he know each surgeon's concept of operability.

With the possible exception of bone tumors the roentgen differentiation between benign and malignant masses is very difficult in non-classical cases. The error is usually that the malignant is called benign in the instances when an opinion as to histopathology is given. The reason for this is that after the obviously malignant are excluded there is most frequently left a tumor which is small, more or less spherical and apparently encapsulated. This is well exemplified in the kidney where practically all surgical problems can be demonstrated. It is not infrequent that a hypernephroma will be globular and may actually have an apparently unbroken calcium wall about it. The reasonable diagnostic expression would contain nothing more specific than the word "mass."

SUMMARY

Limitations in roentgen diagnosis are attributable to: technical obstacles of which many particularly referable to the patient are remediable; other more basic and serious technical considerations that are inherent to the equipment but which are remediable by further engineering progress; lack of proper training of the roentgenologist or restriction self-imposed by, or externally imposed upon the roentgenologist, mostly remediable; incomplete range of demonstrability of gross lesions, extension anticipated but never completely remediable; mimicry of tissue response macroscopically, partially remediable by complete cooperative effort between the roentgenologist and the referring physician.

Jefferson Medical College Hospital

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DISCUSSION

DR. IRA BURNS (Wilmington): Mr. President and Members of the Society: It is too bad that Dr. Wigh had to hurry so rapidly with his paper. I don't know why a radiologist should be so modest anyway.

However, I will be just as rapid in what I have to say. Of course, several factors, as he has described, enter into the successful interpretation and description of pathological entities, but the disappointing things that have annoyed me probably more than anything else are the factors of the bone, the old one with which you are all familiar, osteomyelitis, in which up until approximately seven, and more likely ten days after the infection, there is no destruction of bone that we are able to even term as osteomyelitis. The next morning the surgeon may open the tissue and find pus present. As far as I know, there is no means for overcoming that at the present time.

Another shortcoming is another factor over which we have no control, and that is the metastatic involvement of bone. There must be approximately 40 per cent of destruction of the bone area shown on the x-ray to say fairly definitely that the condition is metastatic malignancy. So up to that point we must report the condition as negative. It is one of those unfortunate things we have to contend with, and, as far as I know, there is no way to overcome the condition.

DR. WIGH: I appreciate Dr. Burns' pointing out some of these other deficiencies of the roentgen method, and it is certainly a problem to us in metastasis to try to tell a surgeon whether or not, for instance in a breast case, he can go ahead with a clear conscience with radical surgery. There is no way around it. The only thing to do is to use clinical means in suggestive cancer metastasis, for instance, percussion over bone to bring out pain, which may be much more satisfactory than the roentgen method.

I want to thank your Society for the opportunity to present this paper.

IN-PLANT RESIDENCY IN INDUSTRIAL MEDICINE

Wilmington Plant
Buick-Oldsmobile-Pontiac Assembly Division
General Motors Corporation
Wilmington 99, Delaware
March 9, 1949

Dear Dr. Bird:

In the past year a great deal has been accomplished in establishing post-graduate courses in Industrial Medicine or Occupational Health. Many medical schools have offered short courses and symposia, and medical schools of the Universities of Pittsburgh, Cincinnati, New York and Colorado have established two to three year programs, including research and industrial in-plant training.

General Motors, about eight months ago, established two in-plant residencies, one affiliated with Yale University School of Medicine, the other with Buffalo University School of Medicine.

These programs have been so successful that General Motors is now establishing ten additional in-plant residencies in industrial medicine. Requirements for such training have been established by the Council of Occupational Health of the American Medical Association, and I enclose a listing of these essentials. The Medical Department of the General Motors BOP Assembly Plant at Wilmington has facilities which designate it as a training center in occupational health.

The Medical Director of the plant will welcome inquiries and interviews from medical men interested in an in-plant residency in Industrial Medicine. The rewards of such training will not only be experience and knowledge leading toward certification, but the stipend itself is much greater than found in the average first year residencies in other specialties.

Very truly yours,

JOHN M. KIMMICH, M. D.,
Medical Director

+ Editorial +

DELAWARE STATE MEDICAL JOURNAL

Owned and published by the Medical Society of Delaware, a scientific society, non-profit corporation. Issued about the twentieth of each month under the supervision of the Committee on Publication.

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Subscription price: $4.00 per annum, in advance. Single copies, 50 cents. Foreign countries: $5.00 per annum.

VOL. 21 MARCH, 1949 No. 3

TEACHING ALLERGY TO UNDERGRADUATES

Allergy is a subspecialty of internal medicine, a subspecialty, however, that in its numerous extensive impingements upon many other fields of medicine as well as in the high incidence of the diseases due to it, should be accorded a prominent and respected position in the family of medical specialties. To attempt to separate allergy from internal medicine or from the other specialties would be a dangerous experiment.

David P. Barr, professor of medicine at Cornell University, several years ago set forth in clear language the need of the internist for a broad and sympathetic understanding of these relationships. He reminds us that "the concept of altered reaction to bacterial and nonbacterial substances is one of the most important ideas of medicine today. It ranks with psychosomatic medicine, with the study of the circulatory apparatus, with bacteriology, with metabolism and with clinical chemistry. It is relevant to the pathogensis and affects the practical management of much more than one-half of all the diseases to which flesh is heir. It is part and parcel of internal medicine and no internist can be regarded as completely trained who is not thoroughly cognizant of the principles of sensitivity, of anaphylaxis and of the altered reaction of the body to proteins."

The allergist stands equally in need of a knowledge of internal medicine, and he must not neglect the techniques by which the internist conducts his comprehensive and searching studies of the patient. It is incumbent upon the allergist to cultivate an awareness of related metabolic, upper and lower respiratory, circulatory, dermatologic, pediatric, and psychosomatic problems. A good allergist must first of all be a good internist.

The question naturally arises where and how these concepts are to be inculcated. That is a problem to which the American Academy of Allergy is now addressing itself, believing that the start must be made in our schools of medicine. Such surveys as have been made to date indicate in many instances a surprising deficiency in undergraduate instruction in allergy. Dr. Oscar Swineford's survey, reported in 1946, showed that of 31 schools questioned, 12 "offered little or no organized instruction in allergy," while in 14 others instruction was obviously inadequate. It is astonishing to learn that in one of our top medical schools only two one-hour lecture periods are devoted to the subject. Inadequate undergraduate instruction is reflected at higher levels, interns and residents showing little interest in or comprehension of the problems of allergy. Barr remarking on the sequel says, "It is more than deplorable that many young internists have been permitted to finish their

training almost without contact with allergy and allergic thought. Some of them have been so crassly ignorant as to regard the whole specialty as a somewhat unnecessary and undesirable field."

There is no evidence to show, however, that professors of medicine, deans of medical schools and curriculum committees are becoming increasingly anxious to assign allergy its proper place in the medical curriculum. The approach appears to lie along a number of roads. It is beginning to be realized that the study of allergy as an undergraduate discipline is handicapped from lack of coordination between the various departments of the medical school, most of which are concerned with, at one time or another, the fundamental principles of allergy. Unnecessary overlapping and serious omissions can be avoided by heads of departments sitting down with a curriculum committee and planning instruction in allergy and its associated specialty immunology from the day the student enters the medical college until his graduation.

The Academy of Allergy has set up what it regards as a minimal allergy curriculum. In its opinion each student should have at least twelve hours of instruction in anaphylaxis, the pathalogic physiology of allergy, the clinical recognition of its manifestations, its etiological diagnosis, and its treatment. An allergy clinic in a teaching institution is regarded as a *sine qua non*. Like every other clinic in such an institution a good allergy clinic has two problems—care of the sick, and the education of future doctors of medicine. It will perform these functions best when its staff consists of trained allergists; when its laboratory equipment and technical assistants are not hampered by budgetary deficiencies. For those students who wish to emphasize allergy or later to pursue it as a specialty, elective courses should be a part of the curriculum.

Instruction in allergy promises to be best in those institutions in which research in the many unsolved problems of both immunology and allergy are attacked on the level of the basic sciences. So closely interknit are the problems of allergy and immunology and so intimately do they concern the internist that the allergist should become the hospital consultant not only in the situations involving clear cut allergic diseases but also in those border-line cases in which the fundamental concepts of immunology and allergy may be involved. Such cooperation would mean much in a teaching institution where undergraduate medical students are so sensitive to the attitudes of their teachers.

But after all is said and done, much as we regret to admit it, undergraduate instruction in allergy depends largely for its success upon the resources, chiefly monetary, that are at its disposal. These may come principally from two sources, the budgetary allowances of the institution to the department and funds earmarked for research by some public spirited individual or by one of the foundations which have so admirably furthered the progress of medicine in a number of other specialties.—Editorial, *Va. Med. Mo.*, January, 1949.

CALL FOR PAPERS

The next session of the Medical Society of Delaware will be held in Wilmington, October 10 and 11. Scientific meetings will be held morning and afternoon on both days. It is hoped that Delaware doctors will contribute their fair share of the program. Those who wish to participate should inform the Executive Secretary promptly, giving their tentative title, and the meeting of their choice.

DR. KRAEMER HONORED

THE JOURNAL has received word that in January last Dr. William H. Kraemer, of Wilmington, was made Associate Professor of Oncology at Jefferson Medical College. THE JOURNAL offers its congratulations to our local confrere.

AMERICAN ACADEMY OF PEDIATRICS

Publication of the national report on the findings of the recently completed 2½-year study of child health services will be marked by a dinner on April 2nd in New York City, according to an announcement of Dr. Warren R. Sisson, President of the American Academy of Pediatrics. A nationally known layman as well as an outstanding authority in medicine and public health are being invited to be guest speakers. The two-volume report which is now in press is being published by the Commonwealth Fund of New York.

MISCELLANEOUS

Americal College of Allergists

More than 1000 physicians interested in allergy from North America and abroad are expected at the Palmer House from 2 p. m. Thursday, April 14, at 5:30 p. m., Sunday, April 17. Everyone who comes is urged to bring his wife and any office personnel interested in the various phases of allergy. Both members and non-members are urged to attend and are required to register and receive a badge. There will be no charge for registration. There will be over 20 scientific exhibits and 40 technical exhibits of interest to allergists.

All those attending the annual meeting are requested to make their own hotel reservations directly with the Palmer House. A block of rooms has been reserved for those attending the meeting. Please direct all correspondence to the Reservation Manager, Palmer House, Chicago 90, Illinois, and include your arrival and departure time, and the type and rate of room desired. Be sure to indicate that you are attending the meeting of the American College of Allergists.

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Britain's "Free Health Service" Can Be Very Expensive

Those who have learned to look with a fishy eye upon efforts by politicians to bring Heaven down to earth know already that every adventure in the uplift costs more in practice than its proponents have promised.

Just now we are learning in this country that old-age pensions, to be worth the appellation, are going to cost each individual from twice to three times what the wizards foresaw in their crystal balls. The British, on their side of the Atlantic, are learning the same expensive lesson about their new national health insurance.

All kinds of strange things show up. For instance, the *Manchester Guardian,* a newspaper given to understatement, has discovered that foreigners visiting England get free medical service under the law, without registering and without going through all the red tape required of natives. One story says that foreign sailors manage to get free false teeth while ashore there, sell them when they get home, then get another free set the next time their ships touch English ports. The *Guardian* thinks this may be an exaggeration, but it prints the tale nevertheless.

The *Times* of London, if anything more reticent than the *Guardian,* carried a report about a woman who wanted her eyeglasses repaired. Under the law repairs are not free, but the lady shifted her demand and got, instead of the 40-cent repairs, two wholly new pairs of spectacles, at a total cost to the state of $22. Another man found that monocles were not included in the free service, so he wangled two new pairs of glasses, took out the lens he wanted from each and now has two new monocles. Total cost to the taxpayer, $24.

Since such things always happen when the Government undertakes something beyond its capacities, it is no wonder that Britain's health insurance this year is costing more than $200,000,000 above what the treasury experts estimated.

Americans probably will not profit by British experience. The unthinking people who are demanding cradle-to-grave security under the leadership of Mr. Truman are for the most part too hypnotized by their vision to see what flimsy stuff it is made of. Nor are they likely to stop and try to understand that the monetary pool on which they hope to draw so freely must be replenished by their own sweat if it is not to run dry.—Editorial, *Baltimore Sun,* March 8, 1949.

Urges Awakening To Threat Of Socialism

Chicago—Business and professional people must abandon their comfortable belief that socialization of medicine and other professions and industry "can't happen here," Dr. Ernest E. Irons, Chicago, president-elect of the American Medical Association, told members of the Woman's Auxiliary of the Chicago Medical Society on Tuesday, March 8.

"I urge you to take this present threat to America and our free institutions seriously. This is a fight to prevent the importation of a ruinous socialism, which developed and has repeatedly failed in Europe, into our up-to-now free America," Dr. Irons said.

Most people are so accustomed to the freedom of American democracy that it is difficult to arouse them to face the threat of socialized medicine and the ultimate socialization of other professions and industry, Dr. Irons declared.

"Among Federal Security Administrator Oscar Ewing's allegation in justification of taking over the medical care of the American people is the charge that the physicians as represented by the American Medical Association have no program, or, if they have, it has worked so badly that we as a nation are about to fall to pieces. The fact is that we enjoy the best health and the best medical care of any nation on earth," he said.

Dr. Irons accused propagandists for socialized medicine of using "Marxian tactics of deception of the people for cheap political purposes."

"In support of his demand for political medicine, Mr. Ewing quotes draft statistics which have been cunningly misstated by those who consistently have been attempting to undermine our government," Dr. Irons said.

"Selective service statistics are mishandled by assuming that the percentage of total rejections represented a cross section of the entire male population subject to draft. The fact is that before the draft there were removed from the group 2,700,000 acceptable men who enlisted voluntarily.

"Another 35.5 per cent were deferred for essential occupation or dependency. Ten million of the remainder were examined from December 7, 1941, to December 31, 1943; 3,600,000 were rejected. Of these rejections, 21.7 per cent were rejected for illiteracy, mental deficiency, and venereal disease; 43.26 per cent for mental disease, defective heart ailments, amputations—a total of almost two-thirds of all rejections.

"By most liberal estimates only about 20 per cent of the rejections were for preventable disease. Political medicine will not cure flat feet or illiteracy.

"Glowing promises are made by Mr. Ewing of complete overall medical care. No mention is made of the certainty of the deterioration of quality of care which inevitably will follow a system administered by governmental regimentation, and which has always followed in nations where compulsory sickness insurance has been tried.

"A payroll tax of 1½ per cent is suggested in present discussion, but even proponents of the plan admit that this tax will quickly rise to 4 per cent and eventually to 9 per cent and more.

"For sales purposes to the people, the cost of administering compulsory medicine is now estimated between three and four billion dollars per year; the real fact is that the cost will rise from six billion to 18 billion per year.

"On the basis of German experience, there will be added to the government employees 1,500,000 more payrollers. The worker already parts with 20 to 30 per cent of his wages through hidden and payroll taxes, and compulsory medicine will take still more from him for a service of dubious quality.

"In this fight for preservation of our freedom in medicine and the preservation of American democracy, there can be no compromise. We are either for or against socialization of medicine and the socialization of America, either black or white. There can be no gray."

Compares Costs Of Medical Care With Cost Of Living Index

Chicago—Costs of medical care have not risen as fast as the cost of living, a comparison of the 1948 Consumers' Price Index with a preliminary index of medical care prices of the U. S. Bureau of Labor Statistics shows.

Writing in the current (Feb. 26) issue of

The Journal of the American Medical Association, Frank G. Dickinson, Ph. D., Chicago, director of the Bureau of Medical Economic Research of the American Medical Association, says the bureau estimates from U. S. Bureau of Labor Statistics figures that the index of medical care items will stand at 141 for 1948.

The final report of the U. S. Bureau of Labor Statistics places the Consumers' Price Index for 1948 at 171.2. The base period 1935-1939 equals 100 in computing the entire index, of which the index of medical care items is a part.

Preliminary figures of the Bureau of Labor Statistics for costs of medical care in 1948 are:

General practitioners' services, 136; surgeons' and specialists' services, 136; dental care, 146; eyeglasses, 124; hospital rates, 212; and prescriptions and drugs, 122.

Figures of the Bureau of Labor Statistics for these items in 1947 were 130.3; 129.4; 137.4; 118.6; 179.6; and 115.4, respectively. The entire cost of living index for 1947 was 159.2.

"The most significant change is in hospital rates, which soared from 179.6 in 1947 to 212 in 1948." Dr. Dickinson comments.

"Prices for laboratory and other services rendered by hospitals are not sampled; hence the hospital index covers primarily room rates. The hospital is uniquely exposed to the forces of inflation. It buys goods and services and sells services soon after purchase. Its costs are not stabilized by such customary accounting items as depreciation and taxes because most hospitals are public institutions. "Hence the changes in current prices of food and fuel and in hourly wage rates are potent in changing hospital room rates charged to patients because there are no other costs of importance.

"The sharp increase in the index of hospital room rates for 1948 over 1947 reflects to some extent the failure of hospitals to raise their rates earlier. The recent decline in prices of farm products has not yet materially reduced the operating costs of hospitals."

The estimates should "set at rest a good many wild and irresponsible statements about the exorbitantly high prices being paid for medical care," adds an editorial appearing in the same issue of The Journal.

BOOK REVIEWS

Premature Infants: A Manual for Physicians. By Ethel C. Dunham, M. D., Federal Security Agency, Social Security Administration, Children's Bureau. Pp. 401, with many illustrations and charts. Paper. Price, $1.25. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 1948.

Part I of this book deals with general considerations—definition of and criteria for prematurity; incidence, causes, and prevention of premature birth; death rates and causes of death; and growth and development of premature infants.

Part II deals with the physiologic handicaps of premature infants; the general problems of their care; and the congenital and acquired conditions that tend to affect them adversely.

This book is a source of the most complete information now available in regard to prematurity, and as a guide for the general care of the premature infant. It ought to be in the hands of every physician having premature infants under his care.

Your Baby: The Complete Book for Mothers and Fathers. By Gladys Denny Shultz and Lee Forrest Hill, M. D., former president, American Academy of Pediatrics. Pp. 278. Cloth. Price, $3.50. Garden City, N. Y.: Doubleday and Company, 1948.

This book gives the latest approved ideas in prenatal care, feeding, training, development, handling illnesses, recipes, and child guidance through infancy to school age. The book is unusual in that it gives very helpful instruction to fathers in the rearing of children.

A special feature is the picture section, in which important instructions are illustrated by photographs and drawings. The last portion of the book is a record section which, when filled in, will make a treasured personal history of the baby's early years.

This is an entirely new type of book which will be found most valuable to parents of infants and children up to six years of age.

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